



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/413,644	10/06/1999	NEIL RICHARDS	S1022/8338	2260

7590 06/01/2004

JAMES H MORRIS
WOLF GREENFIELD & SACKS
600 ALTANTIC AVENUE
BOSTON, MA 02210

EXAMINER

PHILPOTT, JUSTIN M

ART UNIT	PAPER NUMBER
----------	--------------

2665

20

DATE MAILED: 06/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/413,644

Applicant(s)

RICHARDS ET AL.

Examiner

Justin M Philpott

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5 and 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed March 22, 2004 have been fully considered but they are not persuasive.

First, applicant argues (section A, pages 6-7) that Byrn teaches away from intervals being "substantially constant" as recited in the claim 1 by disclosing advantages of using timing wheels having different rates (col. 3, lines 3-10) and therefore one of ordinary skill in the art would not have been motivated to modify the system of Byrn for having substantially constant time intervals. However, as discussed in the previous office action and repeated herein, while Byrn provides for the potential for different wheel rates (e.g., Byrn uses an example of three wheel rates, see col. 4, lines 42-45) and priorities (corresponding to QOS parameters for a VC), each wheel rate is a *fixed* amount (e.g., one slot per cell time, one slot per 10 cell times, etc.). That is, the designated rates are *constant*. Accordingly, the time interval of Byrn is identified as being "substantially constant". Still further, Byrn teaches using different wheel rates for applications needing to support a plurality of VC transmission requirements, wherein a specific wheel rate would correspond to a specific VC requirement (e.g., see col. 4, lines 33-59), and Byrn also teaches different priorities may be implemented for accommodating QOS parameters for a VC (e.g., see col. 4, lines 53-54). However, Byrn further discloses (as also recognized by applicant in "Remarks") that by implementing different priority levels the system may experience undesirable jitter (e.g., see col. 5, lines 23-27). Thus, for systems not requiring specific QOS parameters for specific VCs, one of ordinary skill in the art would be motivated *not* to include

Art Unit: 2665

the priority level feature in such a system as implied by Byrn by discussing undesirable resultant jitter. Similarly, for such systems not needing to accommodate such VC transmission requirements, one of ordinary skill in the art would naturally implement the system of Byrn by selecting a single wheel rate in accordance with the overall system performance. Selecting a single wheel rate and a single priority level in the system of Byrn would yield a substantially constant time interval for all servicing as recited in the amended claim 1. Thus, while Byrn may disclose a preferred embodiment comprising both plural wheel rates and plural priorities, for applications not needing to support specific different VC transmission requirements one of ordinary skill in the art would be motivated to implement a system of Byrn having a single wheel rate and no priority feature for reasons discussed above, which would result in a fixed time interval and which would clearly encompass the recited limitation of "substantially constant" time intervals. Thus, applicant's argument is not persuasive.

Second, applicant argues (section B, pages 7-8) that even if Byrn were modified to include substantially constant time intervals as discussed in the previous office action, such a system would no longer have a scheduling variable (e.g., p or r) indicative of a scheduled transmission timing for that data stream as recited in claim 1. However, setting a scheduling variable (e.g., p or r) in Byrn to a particular value does not remove the element from the system. For example, setting a wheel rate r to a specific value does not cause the system to no longer have a wheel rate. Whether a wheel rate is variable between fixed amounts (e.g., rates 1-3, see col. 4, lines 33-52) or is established to be substantially constant (e.g., selecting one of rates 1-3), the wheel still shifts at a rate according to the determined wheel rate r. Thus, the functionality of wheel rate r remains in the modified embodiment of Byrn. Furthermore, as discussed in the

Art Unit: 2665

previous office action and repeated herein, a cell is scheduled for transmission for a future time by utilizing the wheel rate r (e.g., see col. 4, lines 33-52). Accordingly, applicant's argument that wheel rate r does not indicate when a particular cell is scheduled for transmission is not persuasive.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claims 8-10 recite the limitation "Data transmission apparatus as claimed in claim 7". However, claim 7 has been canceled by applicant. Thus, there is insufficient antecedent basis for the limitations of claims 8-10, which depend upon the canceled claim 7.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1, 3-5 and 8-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,533,020 to Byrn et al.

Regarding claim 1, Byrn teaches a priority-based ATM cell scheduler for a data transmission apparatus. Particularly, Byrn teaches a scheduler comprising the following: a data

Art Unit: 2665

stream control memory (e.g., combination of memory 4 and VCA 7, see FIG. 1) for storing (via VCA 7, see col. 4, lines 55-56) a scheduling variable (e.g., VC transmission requirement corresponding to rate r , see col. 4, lines 40-43, and QOS parameters corresponding to priority p , see col. 4, lines 53-54) for each data stream, each scheduling variable (p, r) being indicative of a scheduled transmission timing (Target Transmission Time TTT, see col. 4, lines 53-59) for that data stream; a clock (reference clock, see col. 4, line 22) for maintaining a current timing indication (Current Transmission Time CTT, see col. 4, line 21); a data stream selector (cell scheduling unit CSU 9 in combination with timing wheels, see col. 4, line 33 to col. 5, line 59) for, at time intervals (depending on rates r , see col. 4, lines 33-52), comparing the scheduling variables (p, r) stored in the memory and selecting the scheduling variables (p, r in the form of timing wheel $W_{p,r}$) indicative of the earliest scheduled transmission timing (TTT) (see col. 4 regarding CSU 9 wherein $W_{p,r}$ selection is indicative of TTT) and, if that scheduled transmission timing (TTT) is not earlier than the current timing (CTT), generating an indication of the data stream corresponding to the selected scheduling variable (see col. 6, lines 34-54, particularly lines 34-37 and 52-54, as well as col. 5, lines 4-28 and particularly lines 24-26 – wherein cells with a $TTT \leq CTT$ are serviced while the other cells of lower priority remain queued with pointers serving as indications of the data stream corresponding to the particular $W_{p,r}$) and incrementing the selected scheduling variable (i.e., incrementing the wheel $W_{p,r}$ according to rate r in order to examine the next highest priority queue); and a data transmission unit (e.g., MMU 8) for receiving the indication of the data stream and transmitting an amount of data from the data stream over the data channel (e.g., next cell out).

However, by providing different wheel rates (r) and priorities (p), Byrn may not specifically teach the data stream selector of the preferred embodiment operates at substantially constant time intervals.

However, while Byrn provides for the potential for different wheel rates (e.g., Byrn uses an example of three wheel rates, see col. 4, lines 42-45) and priorities (corresponding to QOS parameters for a VC), each wheel rate is a fixed amount (e.g., one slot per cell time, one slot per 10 cell times, etc.). That is, the designated rates are constant. Furthermore, Byrn teaches using different wheel rates for applications needing to support a plurality of VC transmission requirements, wherein a specific wheel rate would correspond to a specific VC requirement (e.g., see col. 4, lines 33-59), and Byrn also teaches different priorities may be implemented for accommodating QOS parameters for a VC (e.g., see col. 4, lines 53-54). However, Byrn further discloses that by implementing different priority levels the system may experience undesirable jitter (e.g., see col. 5, lines 23-27). Thus, for systems not requiring specific QOS parameters for specific VCs, one of ordinary skill in the art would be motivated *not* to include the priority level feature in such a system as implied by Byrn by discussing undesirable resultant jitter. Similarly, for such systems not needing to accommodate such VC transmission requirements, one of ordinary skill in the art would naturally implement the system of Byrn by selecting a single wheel rate in accordance with the overall system performance. Thus, while Byrn may disclose a preferred embodiment comprising both plural wheel rates and plural priorities, for applications not needing to support specific different VC transmission requirements one of ordinary skill in the art would be motivated to implement a simpler system of Byrn having a single wheel rate and no priority feature, resulting in a substantially constant time interval, in order to avoid

Art Unit: 2665

experiencing undesirable jitter as implied by Byrn (e.g., see col. 5, lines 23-27). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement the system of Byrn with a single wheel rate and priority for systems not needing to support specific different VC transmission requirements in order to avoid experiencing undesirable jitter as implied by Byrn (e.g., see col. 5, lines 23-27).

Regarding claim 3, Byrn teaches at least one data memory (e.g., memory 4, see FIG. 1) for storing the data streams which are implicitly retrieved prior to transmission.

Regarding claims 4 and 5, Byrn teaches the data stream control memory storing a pointer variable for each data stream (see col. 3, lines 51-67 regarding Virtual Connection queue pointers), and retrieving the amount of data from the location in the data memory (e.g., memory 4) indicated by the pointer variable of the selected data stream (see col. 5, lines 13-16 and 42-46).

Regarding claims 8, 9 and 20, Byrn teaches the apparatus as discussed above regarding claim 1 and further, teaches a priority level is implemented wherein all cells in a higher priority are serviced before the other cells (e.g., see col. 5, lines 22-27) such that higher priority level cells act to override the servicing of the other cells, and further provides a selector (e.g., 51, see col. 5, lines 28-59) to indicate a selection of next data to transmit. Further, regarding claim 9, while Byrn may not specifically disclose disabling periodic comparison of the scheduling variables, at the time of the invention it would have been obvious to one of ordinary skill in the art to disable periodic comparison of the scheduling variables in order to conserve processing power when comparing is not necessary.

Art Unit: 2665

Regarding claim 10, Byrn teaches means for varying the increment variables (wherein different rates r correspond to difference increment variables, e.g., see col. 4, lines 40-45).

Regarding claim 11, Byrn teaches the ATM scheduler provided on a single integrated circuit (see col. 6, lines 66-67).

Regarding claim 12, while Byrn may not specifically disclose the system further comprises a central processing unit, Examiner takes official notice that it is well known in the art for a system comprising the utilization of a VHDL specification language as in Byrn (e.g., see col. 7, lines 3-6) to be coupled to a central processing unit.

Regarding claim 13, while Byrn may not specifically disclose the CPU is located on the same integrated circuit as the transmission apparatus, it is generally considered to be within the ordinary skill in the art to shift the location of parts absent a showing of unexpected results. Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to shift the location of CPU from any location to that of the integrated circuit comprising the transmission apparatus since it is generally considered to be within the ordinary skill in the art to shift the location of parts absent a showing of unexpected results. The contention of obvious choice in design can be overcome if Applicant establishes unexpected results. In re Japikse, 86 USPQ 70 (CCPA 1950).

Regarding claims 14 and 15, Byrn teaches a scheduling variable (p) dependent upon QOS (col. 4, lines 53-54) and further teaches values in the system are programmable (e.g., see col. 7, lines 3-6, wherein VHDL specification language is utilized for VLSI design).

Regarding claim 16, while Byrn may not specifically teach an amount of data specifically being 384 bits, it is generally considered to be within the ordinary skill in the art to adjust, vary,

Art Unit: 2665

select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on Appellant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to set the amount of data in Byrn to be 384 bits, since it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value.

Regarding claims 17 and 18, Byrn teaches an amount of data in the form of an ATM cell (e.g., see Title) which implicitly includes both data and header information.

Regarding claim 19, Byrn teaches the apparatus discussed above regarding claim 1 and further, teaches the data stream control memory (e.g., combination of memory 4 and VCA 7, see FIG. 1) stores an increment variable (rate r), and to increment the selected scheduling variables (e.g., increment the position of the wheel $W_{p,r}$) the data stream selector (cell scheduling unit CSU 9 in combination with timing wheels) adds the selected scheduling variable (current position of wheel $W_{p,r}$) to the increment variable (rate r) (or rather, adds the increment variable to the selected scheduling variable) for the corresponding data stream.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 5,818,839 to Sterne et al. discloses a timing reference for scheduling data traffic on multiple ports.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2665

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Justin M Philpott



HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600